

I claim:

1. A method of monitoring a chemical reaction in which substance A is converted to product B, said method comprising: incubating substance A in the presence of a signaling aptamer that has a first affinity for substance A and a second, different affinity for product B, determining the amplitude of the signal based on the affinity of the aptamer for substance A and monitoring for a change in amplitude of the signal.
2. A method according to claim 1, wherein a change in amplitude of the signal is indicative of a modification of substance A whereby binding of the signaling aptamer to substance A is disrupted.
3. A method according to claim 1, wherein an increase in the amplitude of the signal is indicative of binding of the aptamer to product B.
4. A method according to claim 1, wherein a decrease in the amplitude of the signal is indicative of binding of the aptamer to product B.
5. A method according to claim 1, wherein the signaling aptamer has a fluorophore and a quencher in proximity.
6. A method according to claim 5, wherein the signaling aptamer is a signaling aptamer complex (SAC)

comprising an aptamer oligonucleotide and a quencher modified oligonucleotide capable of forming a duplex with the aptamer oligonucleotide in the absence of an aptamer binding target.

7. A method according to claim 1, wherein the chemical reaction is addition of a functional group to substance A.
8. A method according to claim 1, wherein the chemical reaction is removal of a functional group from substance A.
9. A method according to claim 1, wherein the chemical reaction is a phosphorylation reaction.
10. A method according to any one of the preceding claims, wherein substance A is a substrate for an enzyme and product B is a product of an enzymatic reaction.
11. A method according to claim 10, wherein the substrate is selected from the group consisting of inosine, adenosine, cAMP, AMP, ADP and ATP.
12. A method according to claim 10, wherein the enzyme is selected from the group consisting of a phosphatase, a deaminase, an adenylyl cyclase and a phosphodiesterase.

13. A method of detecting the presence of an enzyme capable of converting a substrate to a product in a test sample, said method comprising: incubating the substrate with a signaling aptamer that has a different affinities for the substrate and the product in the presence of the test sample and monitoring for a change in signal, wherein a change in signal intensity indicates enzymatic activity in the test sample.
14. A method according to claim 14, wherein an increase in signal intensity indicates the presence of the enzyme.
15. A method according to claim 14, wherein a decrease in signal intensity indicates the presence of the enzyme.
16. A method of quantitating an enzyme in a sample, said method comprising incubating a substrate with a signaling aptamer in the presence of the sample, measuring the amplitude of the signal generated and comparing the amplitude of the signal to a standard curve of signal relative to enzyme concentration.
17. A method of screening a test compound for inhibition of an enzyme, said method comprising: incubating a substrate with a signaling aptamer that has a first affinity for the substrate and a second, different affinity for product, in the presence of the test compound and the enzyme; and monitoring for a change in

amplitude of the signal, wherein a change in signal is indicative of enzyme activity and no change is indicative of inhibition of the enzyme.

18. A method according to claim 18, wherein the enzyme is selected from the group consisting of a phosphatase, a deaminase, an adenyl cyclase and a phosphodiesterase.
19. An enzyme inhibitor identified according to the method of claim 18 or 19.
20. A kit for detecting modification of a substrate, said kit comprising a substrate and a signaling aptamer having an affinity for the substrate, wherein the signaling aptamer has a different affinity for modified substrate.
21. A kit for screening for enzyme inhibitors, said kit comprising a substrate, an enzyme capable of acting on the substrate to produce a product, and a signaling aptamer having a first affinity for the substrate and a second affinity for the product.